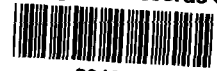




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**COMMENTS ON THE U.S. EPA'S PROPOSED
CLEANUP PLAN FOR GROUNDWATER
CONTAMINATION**

**EVERGREEN MANOR SITE
ROSCOE, ILLINOIS**



COMMENTS ON THE U.S. EPA'S PROPOSED CLEANUP PLAN FOR GROUNDWATER CONTAMINATION

EVERGREEN MANOR SITE
ROSCOE, ILLINOIS

SEPTEMBER 2003

REF. NO. 009234 (3)

This report is printed on recycled paper.

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EXECUTIVE SUMMARY

Introduction

This report has been prepared by Conestoga-Rovers & Associates (CRA) on behalf of Ecolab Inc (Ecolab) in response to EPA's proposed cleanup plan (Proposed Plan) for the Evergreen Manor Site dated July 2003, and other related reports

The Proposed Plan included an evaluation of three cleanup options, including, No Action (Alternative 1), Groundwater Pump and Treat (Alternative 2), and Monitored Natural Attenuation (Alternative 3) The proposed alternative selected by the Environmental Protection Agency (EPA) is monitored natural attenuation (Alternative 3) The selected alternative describes work proposed to be performed in addition to the response actions taken to date, which include connecting residents to municipal water and the enactment of a local ordinance prohibiting groundwater use at the Site

The proposed cleanup plan relies on a Remedial Investigation (RI) completed in 2001, and subsequent reports released in July 2003, including a Feasibility Study Report (FS), Groundwater Data Evaluation Report (redacted version) (GDER), and an Air Sampling Report (redacted version) (ASR) Additionally, a cursory one page and revised risk assessment addendum was released to the public on August 26, 2003

Ecolab's comments present strong and compelling technical arguments that the work conducted by EPA's contractor is faulty and, based on the data available, much of the additional work proposed is extravagant and unnecessary The following Executive Summary provides an overview of Ecolab's major concerns and is supported by detailed comments in later sections which document the technical foundation for these concerns The main points of the Executive Summary and the major comments are

- groundwater is not used by residents at the Evergreen Manor Site and so there can be no exposure via ingestion, dermal contact or inhalation from groundwater piped into homes,
- groundwater chemical concentrations are decreasing over time and are near or below regulatory goals,
- the revised risk assessment prepared by EPA's contractor is faulty,
- the indoor air chemicals measured in houses at Evergreen Manor are from background sources and are unrelated to groundwater,
- the additional investigations and research proposed by EPA's contractor may implicate residents as responsible parties at the Site,

- the Feasibility Study, and associated recommendations, are unrelated to actual conditions at the Site.

This Executive Summary provides a general technical analysis that supports these six major points. Further, general Comments A-J in Section 1.0 provide comments on the approach used by EPA's contractor. Additionally, the Specific Comments in Sections 2-7 provide over 100 specific detailed comments on the Proposed Plan and supporting documents.

Groundwater Use

In 1999-2000 (Proposed Plan), EPA successfully completed a remedy which connected the Evergreen Manor residents to a municipal potable water supply. Institutional controls were implemented in 1999 (GDER, 2003, Appendix G), including a prohibition against construction and use of groundwater wells. These two remedies effectively eliminated exposure to groundwater chemicals.

EPA's contractor ignored EPA's own remedy and instead assumed a hypothetical exposure pathway where none exists. Had the risk assessment been conducted in accordance with the NCP and EPA guidance (EPA 1989) and properly considered the completed remedy, it would be shown that this exposure pathway is not complete and no resident is exposed to groundwater. Moreover, the reliance on this exposure pathway is diametrically opposed to the position expressed in the Remedial Investigation, which states:

"The result of this removal action is that it has effectively deleted the residential well exposure route pathway that was discussed in the human health risk assessment. Thus, since the exposure pathway has been eliminated, the associated human health risk has also been eliminated."[emphasis added] (2001 RI, Section 11, p. 6)

Groundwater Chemicals are Decreasing

Groundwater chemical concentrations at the Site are rapidly decreasing and the groundwater data presented by EPA's contractor graphically demonstrate this trend. The RI report prepared by EPA's contractor states that additional "soil and sediment sampling is not warranted, and no new monitoring wells are recommended at this time" (RI Section 11, p. 7). In addition, recent quantitative groundwater data show that TCE is present in concentrations at or below the groundwater goal of 5 µg/L and PCE is present at a maximum concentration only slightly above the regulatory goal.

Risk Assessment

EPA's contractor has prepared three separate risk assessments for the Evergreen Manor Site. Two of these are based on the erroneous assumption that a resident is consuming the groundwater. Due to the successful completion of an alternate water supply remedy, the assumptions in the 2001 risk assessment that an individual can consume, have dermal contact with and inhale vapor from the Site from tap water are simply not true.

The third risk assessment, provided by EPA on August 26, 2003, which is a single page with no supporting documentation, also assumes that groundwater is being piped into homes and estimates risks using this non-existent exposure scenario. This third risk assessment has a number of other fatal errors including: use of data that is not in the project database, the use of a maximum concentration rather than a 95% upper bound average concentration, the use of a method that is inconsistent with the EPA Vapor Intrusion guidance for evaluating inhalation exposure to indoor air chemicals and the use of inhalation Slope Factors that are not supported by the EPA's Integrated Risk Information System (IRIS) database. Moreover, the 95% UCL of groundwater for the Site demonstrate that groundwater has already achieved an average concentration below the regulatory goals for the Site.

In addition to being unsupported by EPA's IRIS database, the Slope Factor for TCE used by EPA's contractor at this Site in Roscoe, Illinois is six times more conservative than the Slope Factor approved for use by EPA at the Warner Electric Site in Roscoe, Illinois, just down the road.

The second risk assessment was prepared by EPA's contractor as part of the EPA's Air Sampling Report and uses indoor air data. These indoor air data are within the normal range of background indoor air chemicals due to consumer products and normal residential activity (cars, lawnmowers, paints, home improvement projects and hobbies). EPA's contractor was unable to find any demonstrable nexus between indoor air chemicals and those found in groundwater due to the Evergreen Manor Site.

Indoor Air Chemicals

EPA's contractor measured indoor air chemicals in basements and 1st floor rooms at the Site. These data reflect nothing more than background indoor air. This can be seen from the fact that 1st floor concentrations are often higher than basement concentrations, houses with attached garages (where chemicals are stored) have higher concentrations,

and in some cases the chemicals were noted as "related to groundwater" when the chemicals were never detected in groundwater

The Air Sampling Report provides no quantitative or qualitative link between groundwater contaminants and indoor air chemicals except that perhaps they were once found in groundwater. The indoor air monitoring data are wholly consistent with indoor air data observed at unimpacted houses across the United States.

EPA's Approach Will Implicate Homeowners As Potentially Responsible Parties (PRPs)

The Feasibility Study prepared by EPA's contractor proposes to investigate the nature of soil vapor around homes at the Evergreen Manor Site because they suspect the presence of soil contamination. Further work demonstrating that spills and releases and septic system usage related to household activities may contribute to groundwater contamination will not further the remedy or lead to clarity concerning the nature of groundwater vapors and indoor air. Moreover, the results of this work effort may lead to the identification of homeowner PRPs by EPA.

Feasibility Study

The evaluation of alternatives is heavily biased against the No Action remedial alternative. The Proposed Plan concluded that the No Action alternative "Does Not Meet Criteria" for every category evaluated despite the fact that the No Action alternative relies on the same processes (e.g., natural attenuation) and controls (e.g., an ordinance prohibiting groundwater use) as the Monitored Natural Attenuation (MNA) alternative. It was even determined that the No Action alternative did not meet the criteria for implementability yet No Action is the most readily implementable remedy.

Recommendations

To address the perceived bias, overestimation of risk, and unnecessary tasks associated with the Proposed Plan and the reports on which it is based, Ecolab requests that the remedial alternatives be reevaluated by the EPA. Ecolab also requests the consideration of two additional alternatives whose costs are expected to fall between the No Action alternative (\$0) and the MNA alternative (\$8,500,000).

- **Alternative 1B - No Additional Action** This alternative would be identical to the existing No Action alternative except that the response actions which have already been completed at the Site (connection of residents to a municipal water supply and a local ordinance prohibiting groundwater use) would be appropriately recognized.

- **Alternative 3B - Continued Monitoring.** This alternative would be identical to the existing MNA alternative except that monitoring would be limited to periodic sampling of the existing well network consistent with most other MNA remedies selected by EPA.

1.0 GENERAL COMMENTS

GENERAL COMMENT A - GROUNDWATER IS NOT USED IN HOMES AT EVERGREEN MANOR AND SO THERE IS NO RISK FROM GROUNDWATER INGESTION, DERMAL CONTACT, OR INHALATION FROM SHOWERING OR WASHING CLOTHES.

In 1999-2000 (Proposed Plan), EPA successfully completed a remedy to hook up local Evergreen Manor residences to a municipal potable water supply. In addition, an institutional control by way of a local prohibition against construction and use of groundwater wells was promulgated in 1999 (GDER, 2003, Appendix G). The combination of these two final remedies effectively eliminated exposure to groundwater contaminants to the extent elevated concentrations were ever observed. Nevertheless, EPA's contractor ignored EPA's own remedy to assume a hypothetical exposure pathway where none exists. Had the risk assessment been conducted in accordance with the NCP and EPA guidance and properly considered the completed remedy: no risk from the Site exists because no one is exposed to groundwater. The reliance on this exposure pathway is diametrically opposed to the position expressed in the Remedial Investigation, which states:

"The result of this removal action is that it has effectively deleted the residential well exposure route pathway that was discussed in the human health risk assessment. Thus, since the exposure pathway has been eliminated, the associated human health risk has also been eliminated."[emphasis added] (2001 RI, Section 11, p. 6)

GENERAL COMMENT B - THE REVISED RISK ASSESSMENT IS BASED ON AN ERRONEOUS, UNREPORTED, OR HYPOTHETICAL TCE CONCENTRATION.

On August 26, 2003, EPA released a letter that contained a one-page addendum to Section 9, Risk Assessment, of the Weston 2001 Remedial Investigation Report (Weston, 2001). This addendum, titled "Recalculated cancer risk for adult exposure to groundwater using reasonable maximum exposure assumptions in 2001 risk assessment with revised toxicity values TCE and PCE and 2002 groundwater data" was a series of risk re-calculations for an adult hypothetically exposed to groundwater. It incorrectly assumed that no remedy had been implemented at the Site and local groundwater was a source of risk via ingestion, dermal contact and inhalation. A groundwater concentration of 0.0079 (units not provided, but assumed to be milligrams per liter (mg/L)) was used. This concentration could not be found in the Evergreen Manor groundwater database for any sampling event, including 2002 groundwater data as stated in the title. Indeed this datum is higher than any of the TCE or PCE

concentrations ever reported by EPA in the 2002 data set but was nevertheless used to represent the TCE concentration across the entire Site

The highest groundwater concentration for TCE in the Evergreen Manor database was 0.0072 (J) mg/L. This value is marked with a "J" qualifier indicating the value was not accurately measured but estimated. A single estimated data point to represent an area should not be used for the purposes of quantitatively estimating risk and for selecting a final Site remedy.

The highest unqualified, accurately measured, TCE concentration at this Site was 0.0047 mg/L. This concentration is below the Maximum Contaminant Level (MCL) for TCE and therefore the Site is in compliance with the groundwater ARAR for TCE.

GENERAL COMMENT C - THE MAXIMUM DETECTED GROUNDWATER CONCENTRATION SHOULD NOT HAVE BEEN USED FOR ESTIMATING RISK AND REMEDIAL DECISION MAKING. THE USE OF AN AVERAGE CONCENTRATION IS APPROPRIATE UNDER US EPA'S GUIDANCE DOCUMENTS

The 2002 data set establishes that no PCE in the residential area exceeds EPA's MCL. Indeed, the closest groundwater monitoring point with an observed PCE exceedence is located over 5,000 feet away from Evergreen Manor. Moreover, this sole MCL exceedence of 5.9 µg/L for PCE was only marginally above the MCL and was observed in a monitoring well, not a well used to supply potable water. Nevertheless, EPA's contractor inappropriately applied this highest point concentration across the entire Site as the input concentration for purposes of recalculating Site risks.

As stated in its guidance, "EPA recommends using the average concentration to represent 'a reasonable estimate of the concentration likely to be contacted over time' (EPA 1989) and "because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this [exposure point concentration] variable" (EPA 2002). EPA's contractor disregarded EPA's clearly stated requirements and used a maximum value to estimate risk and evaluate groundwater against Site groundwater goals. The only inferred objective for using the maximum is to show a risk where no unacceptable risk actually exists. The goal of a risk assessment is to accurately calculate the risks to a person over a long period of exposure using average exposure concentrations (EPA 1989). EPA requires the use of the 95 percent upper confidence limit of the mean for groundwater (EPA 1992) to calculate the concentration term for use

in a risk assessment. If EPA's contractor had complied with EPA's own guidance and incorporated all of the data, even including the inaccurate "J" qualified data, a groundwater concentration of 0.0025 for TCE and 0.0035 for PCE should have been used. Both of these values are less than the MCL. Nevertheless, if these values had been used, the recalculated risk assessment would have shown risks of 7.47×10^{-5} which are well within the EPA's acceptable risk range of 1 in 1 million to 100 in one million (10^{-4} to 10^{-6}) and no additional work would be required at the Site.

GENERAL COMMENT D - THE RE-CALCULATED RISK ASSESSMENT USES A CANCER SLOPE FACTOR FOR TCE THAT IS NEITHER ACCEPTED BY EPA NOR RECOGNIZED BY EPA'S INTEGRATED RISK INFORMATION SYSTEM.

EPA lists its approved Cancer Slope Factors for chemicals on its integrated risk information system (IRIS). The Slope Factor for TCE was removed in 1989 and EPA is developing a revised toxicological profile and Slope Factor for this chemical. The revised toxicological profile has been released for public review and it contains an EPA toxicologist's derived Slope Factor for TCE (EPA 2001). This profile has been reviewed by EPA's Science Advisory Board (EPA 2002) and sent back for revisions due to problems with the underlying science used in its development. Other groups have criticized the underlying science behind the Cancer Slope Factor derivation and EPA Region 8 has rejected it, preferring to use an alternative. This draft toxicological profile should not be used to calculate risk at the Site until the problems and questions have been addressed and the Slope Factor is published on IRIS.

GENERAL COMMENT E - THE RE-CALCULATED RISK ASSESSMENT USES A CANCER SLOPE FACTOR FOR PCE THAT IS NOT ACCEPTED BY EPA OR RECOGNIZED BY EPA'S INTEGRATED RISK INFORMATION SYSTEM (IRIS).

EPA has no current determination of the carcinogenicity of PCE (IRIS 2003) but is in the process of developing a revised toxicological profile and Slope Factor for this chemical. The draft toxicological profile will reportedly not be issued for public review until later this year. In the absence of a final approved Slope Factor, the value recommended by the EPA National Center for Exposure Assessment should be used. To that end NCEA provided a value lower than that used by EPA's contractor. The higher draft unsubstantiated value should not have been used for quantitatively estimating Site risks.

GENERAL COMMENT F - THE REVISED RISK ASSESSMENT OMITTS THE CHILD EXPOSURE PATHWAY AND SO IS INCOMPLETE.

The recalculated risks provided as, "Recalculated cancer risk for adult exposure to groundwater using reasonable maximum exposure assumptions in 2001 risk assessment with revised toxicity values for TCE and PCE and 2002 groundwater data," provides a risk estimate for an adult exposure scenario, ignoring the installed Site remedy and assuming, incorrectly, that groundwater is used in a house, and cites the 2001 RI. However, Section 9 of the RI calculates risks for both an adult and a child. The recalculation fails to include this pathway, but should if it is to be consistent with the first risk assessment. Including a child scenario will lead to higher estimated risks and is consistent with the prior risk assessment. However, this method of calculation is no longer appropriate because there is no longer exposure via this pathway.

EPA guidance (EPA 2001b, EPA Region 8 2000) does not recommend the use of a child/adult exposure scenario for inhalation, but the use of an adult exposure scenario only. This is consistent with the EPA's Vapor Intrusion Guidance (EPA 2001b) generally used by EPA's contractor in their Indoor Air Risk Assessment (Weston, 2003), but not for this aspect, thereby resulting in a higher estimated risk. The methodology used by Region 8 and in the VIG is the methodology that should have been used in the risk recalculation. Changing the exposure duration from 24 to 30 years, and not including the child portion of the calculation can correct this.

GENERAL COMMENT G - EPA'S CONTRACTOR FAILED TO SHOW THAT INDOOR AIR CHEMICALS ARE RELATED TO GROUNDWATER.

In its data evaluation of the Indoor Air risk assessment, EPA's contractor did not evaluate groundwater as a potential source of soil vapor and indoor air chemicals. The best example of this is for the gasoline chemicals (e.g., benzene, ethyl benzene, etc.). Benzene has never been found in groundwater at the Site and should have been eliminated from any indoor air analysis. It is found in gallon quantities in almost every automobile in America and is present in many homes, especially those with attached garages, at high levels. Nevertheless, the report states that benzene is Site related (ASR, Table 7-4) and uses elevated risk level to justify additional field studies and research.

The levels of chemicals in soil vapor do not justify additional soil vapor investigations. These soil vapor levels are highly variable and sporadic, around the houses sampled. This variability indicates potential small local sources such as small spills by home owners (while filling a lawn mower, painting, etc.), cleaning fluids from septic tanks and

other small sources. These types of chemicals are unrelated to the groundwater issues investigated as part of the RI for the Site as a whole. EPA's contractor is recommending that all of these small sources be characterized, but this characterization is unrelated to and not the responsibility of the groundwater RI/FS. Its outcome should have no bearing in the remediation of groundwater.

GENERAL COMMENT H - THE INDOOR AIR RISK ASSESSMENT CALCULATES THE RISK FROM BACKGROUND INDOOR AIR AND NOT SITE-RELATED CHEMICALS.

All homes contain "household products" that contain chemicals, or there are residual chemicals present from home construction, house paints, furniture and hobbies, and gasoline from cars, lawn mowers and snow blowers (background chemicals). These products all add risk to the air in a home, but they are essentially ubiquitous in a domestic environment. The Air Sampling study measured these background indoor air chemicals. However, EPA's contractor incorrectly assumed that most of these chemicals were present due to vapors from groundwater and not household products. The Site indoor air chemical data has been used to justify an indoor air research project to further characterize indoor air regardless of its lack of connection to groundwater. There are numerous papers, including those in the VIG, that show ranges of indoor air chemicals. The data collected by EPA's contractor are all within the ranges of these prior studies.

GENERAL COMMENT I - THE GROUNDWATER RISK ASSESSMENT USED TO JUSTIFY ADDITIONAL INVESTIGATION AT THE SITE HAS NO RELATIONSHIP TO THE INVESTIGATION BEING PROPOSED.

The risk assessment used to justify additional investigation at the Site is the incorrect recalculation of risks using the methodology provided in Weston 2001. This assessment ignores the completed remedy and falsely assumes groundwater is piped into the house and releases hazardous vapors via showering. EPA's contractor has proposed over \$8 million of additional investigation to collect data related to a hypothetical vapor migration and indoor air risk.

In 2001, EPA's contractor concluded that "soil and sediment sampling is not warranted and no new monitoring wells are recommended at this time" (Remedial Investigation, Section 11, p. 7). In 2002, supplemental Site groundwater data was collected, indicating lower Site-wide concentrations than observed during previous monitoring events. In spite of the obvious temporal trends of declining PCE and TCE concentrations, additional investigation activities estimated to cost over \$8 million were recommended.

in 2003 (Proposed Plan). Even when contaminant concentrations were higher, EPA's own contractor concluded that no "soil and sediment sampling... and no new monitoring wells are recommended" (Remedial Investigation, Section 11, p. 7).

GENERAL COMMENT J - EPA'S CONTRACTOR IS IMPOSING UNREALISTIC STANDARDS AT EVERGREEN MANOR COMPARED TO OTHER EPA REGION 5 SITES.

Issues similar to those at Evergreen Manor have been identified at Warner Electric's Facility, Roscoe, Illinois and EPA Region 5 recently approved a work plan to investigate the potential for indoor air impacts due to volatile organic chemicals in groundwater through vapor migration pathways. This work plan, prepared by MacTec, recognizes that background indoor air chemicals are present in indoor air due to normal residential activities and reports a range for background 1,1,1-TCE and TCE provided by EPA's Vapor Intrusion Guidance (EPA, 2002). A similar approach should have been used at Evergreen Manor. Using the same citation, background indoor air concentrations for the potential groundwater chemical PCE would be 21.1 µg/m³. This exceeds any level of PCE found in indoor air at the Evergreen Manor Site. EPA Region 5 has already approved the use of indoor air background at similar Sites.

At the same Site, EPA has approved a screening level of 1 µg/m³ for screening level TCE in indoor air. The level used by EPA's contractor for TCE at the Evergreen Manor Site was 0.017 µg/m³. This level is about 60 times more conservative than approved by EPA as a screening level at the Warner Electric Facility. The Warner Electric Facility Work Plan uses a mid-point Slope Factor of 8.5 E-2 (mg/kg/day)⁻¹ from the range of Slope Factors provided by EPA for evaluating TCE via inhalation. If this mid-point Slope Factor were used by EPA's contractor at the Evergreen Manor Site, the risk calculated would be 6 fold lower and demonstrate there is no unacceptable risk the Evergreen Manor Site.

2.0 SPECIFIC COMMENTS ON THE PROPOSED PLAN

Comment 1 Comments on the proposed plan pertain to the "EPA Proposes Cleanup Plan for Ground-Water Contamination, Evergreen Manor Site, Roscoe, Illinois," EPA, Region 5, Chicago, Illinois, July 2003. The comments with regard to the proposed plan show:

- natural attenuation is an appropriate remedy
- the evaluation of alternatives is heavily biased towards further investigation by EPA's contractor
- Site risks are mischaracterized, unrealistic, and exaggerated
- the selected alternative contains investigative tasks that are inappropriate in both scope and purpose.

Comment 2 Due to the response actions previously completed at the Site and the declining concentrations of contaminants in groundwater, the EPA's proposal to use "natural attenuation to clean up the remaining ground-water contamination" (Proposed Plan, p. 1) at the Site is an appropriate remedy and fully protective of human health and the environment.

Comment 3 One of the "Main Findings" of the proposed plan is that "EPA would like to continue ground-water and vapor monitoring" (Proposed Plan, p. 1). This is not an appropriate rationale for the proposed 8.5 million dollar expenditure.

Comment 4 The notion that "[g]round-water vapors were found in some homes, but not at levels that are hazardous" (Proposed Plan, p. 1) is contradicted by the data presented in the GDER, which indicates that there was no correlation between indoor air concentrations and groundwater concentrations. Rather it is apparent that the levels found are consistent with domestic background sources.

Comment 5 The statement "EPA found that some chemicals from the Site may be getting into area homes" (Proposed Plan, p. 2) is contradicted by the data presented in the GDER, which indicates that there was no correlation between indoor air concentrations and groundwater concentrations.

Comment 6 The Proposed Plan acknowledges that "residents are connected to the North Park water supply and are not drinking contaminated groundwater" (Proposed Plan, p. 2). Despite this, the Proposed Plan describes risks to people and the environment as including the "risks from using the ground water for drinking and

showering, and from potentially breathing Site-related chemicals found in the indoor air" (Proposed Plan, p. 2).

Comment 7 The No Action (Alternative 1) remedy "does not include... local government controls to limit or restrict new wells from being installed in contaminated areas" (Proposed Plan, p. 4). The No Action alternative ignores the fact that response actions have already been completed at the Site.

Comment 8 The evaluation of alternatives culminating in the proposed plan is replete with problems in analysis, for example, due to the response actions already taken (connection to municipal water and an ordinance prohibiting groundwater use), Alternative 1 (No Action) and Alternative 3 (MNA) are essentially the same remedy except that Alternative 3 includes groundwater and vapor monitoring. Yet MNA "meets criteria" and No Action does "does not meet criteria" for a variety of comparisons that do not depend upon monitoring, including 1) long term effectiveness and permanence, 2) reduction of toxicity, mobility or volume through treatment, 3) short-term effectiveness.

Comment 9 The overall protection of human health and the environment criteria "[e]valuates whether a cleanup option provides adequate protection and evaluates how risks are eliminated, reduced or controlled through treatment, engineering controls or local government controls" (Proposed Plan, p. 7). A determination was proposed that the No Action (Alternative 1) does not meet this criteria. The rejection of this criteria ignores the response actions that have already been completed at the Site, including the connection of residents to municipal water and the enactment of an ordinance to prohibit groundwater use. The response actions taken to date constitute "engineering controls" and "government controls." The Remedial Investigation describes how "risks are eliminated, reduced or controlled," stating, "The result of this removal action is that it has effectively deleted the residential well exposure route pathway that was discussed in the human health risk assessment. Thus, since the exposure pathway has been eliminated, the associated human health risk has also been eliminated." (2001 RI, Section 11, p. 6).

Comment 10 Long-term effectiveness and permanence "[c]onsiders any remaining risks after a cleanup is complete and the ability of a cleanup option to maintain reliable protection of human health and the environment once cleanup goals are met" (Proposed Plan, p. 7). A determination was proposed that the No Action (Alternative 1) remedy did not meet this criteria. The rejection of this criteria ignores the fact that contaminant concentrations are decreasing over time and are expected to fall below MCLs in a few years. Natural attenuation is a permanent process that destroys the chemicals and, unlike pump and treat, is not subject to rebound after the system is turned off. It also

ignores the fact that residents were permanently connected to the municipal water supply, and the fact that a local ordinance was enacted to permanently prohibit groundwater use at the Site.

Comment 11 Short-term effectiveness "[c]onsiders the time needed to clean up a Site and the risks a cleanup operation may pose to workers, the community and the environment until cleanup goals are met" (Proposed Plan, p. 7). A determination was proposed that the No Action (Alternative 1) remedy did not meet this criteria. The rejection of this criteria is not supported when considering that 1) the estimated cleanup time for No Action and MNA (Alternative 3) are identical, 2) No Action poses less risk to workers, and 3) No Action and MNA both rely on completed response actions including municipal water supply and groundwater use prohibitions.

Comment 12 Reduction of toxicity, mobility, or volume through treatment "[e]valuates a cleanup option's use of treatment to reduce the harmful effects of the contaminants, their ability to move in the environment and the amount of contamination present" (Proposed Plan, p. 7). A determination was proposed that the No Action (Alternative 1) did not meet this criteria. The rejection of this criteria is not supported considering that No Action and MNA (Alternative 3) remedies both rely exclusively on natural attenuation for the reduction of toxicity, mobility, or volume.

Comment 13 Implementability is "the technical and administrative feasibility of implementing a cleanup option and includes factors such as the relative availability of goods and services" (Proposed Plan, p. 7). With no explanation, the No Action remedy is categorized as "does not meet criteria" for implementability. This is simply incorrect. The proposed determination suggests an unwillingness on the part of EPA or its contractor to consider the No Action remedy except as a formality.

Comment 14 Since concentrations detected in groundwater are very low and decreasing, the No Action alternative was not properly evaluated.

3.0 SPECIFIC COMMENTS ON THE FEASIBILITY STUDY

Comment 15 The comments in this section pertain to the Feasibility Study, Evergreen Manor Site, Roscoe, Illinois, Weston Solutions, Inc., July 2003. The comments with regard to the feasibility study show that the evaluation of alternatives is based on:

- overstated risk assumptions that are not warranted,
- assumes indoor air is a problem when the data suggests that it is not,
- proposes additional investigation with a scope that is clearly beyond that which is reasonable or necessary.

Comment 16 The risk assessment used to justify additional investigation at the Site is the incorrect recalculation of risks using the methodology provided in Weston 2001. This assessment ignores the completed remedy and falsely assumes groundwater is piped into the house and releases hazardous vapors via showering. EPA's contractor has proposed over \$8 million of additional investigation to collect data related to vapor migration and indoor air. Yet, these investigations will not address any hypothetical risks from groundwater being piped into a house as envisaged by the recalculated risk estimate.

Comment 17 In 2001, EPA's contractor concluded that "soil and sediment sampling is not warranted and no new monitoring wells are recommended at this time" (Remedial Investigation, Section 11, p. 7). In 2002, supplemental Site groundwater data was collected, indicating lower Site wide concentrations then observed during previous monitoring events. In spite of the obvious temporal trends of declining PCE and TCE concentrations, additional investigation activities estimated to cost over \$8 million were recommended in 2003 (Proposed Plan). Even when contaminant concentrations were higher, EPA's own contractor concluded that no "soil and sediment sampling... and no new monitoring wells are recommended" (Remedial Investigation, Section 11, p. 7).

Comment 18 Soil vapor and indoor air monitoring proposed by EPA's contractor is not justified because the Air Report prepared by Weston showed risks to residents from their indoor air was within the acceptable risk range.

Comment 19 EPA's contractor is proposing a research that consists of collecting hundreds of samples to evaluate soil gas and shallow groundwater. There is no risk-based justification for this investigation. Groundwater has been shown to have groundwater concentrations that are below the MCL on average and maximum concentrations that are almost at the MCL. Indoor air samples have been shown to have

risks that are within the EPA's acceptable risk range, especially when only indoor air chemicals also found in groundwater are considered.

Comment 20 Based on the current groundwater monitoring data, EPA's contractor has no basis for conducting further soil vapor and indoor air investigations associated with the Evergreen Manor Site. This research project is based on a misunderstanding of the nature of vapor intrusion from a groundwater source. For example, page 37, states that, "Soil sampling may be needed at locations where groundwater sample results do not correlate well with soil gas results to determine whether there are any homeowner spills." If there is no groundwater problem, there can be no groundwater-derived indoor air problem. Researching homeowner chemical spills is not and should not be the objective of additional Site-related work.

Comment 21 EPA's contractor is proposing to collect hundreds of indoor air samples over at least two years. This study is unnecessary and poorly conceived, based on their approach in the "Indoor Air Report" (Weston, 2002), the study will continue to research what is apparently a background indoor air quality issue. That is, monitor vapors within the home generated by the owner. The study design will generate indoor air data that is unrelated to groundwater. For example, monitoring air near a garage to show the presence of BTEX-related chemicals would never allow the elimination of BTEX as a groundwater source, if the contractor does not believe its absence in groundwater is not already adequate to show this.

Comment 22 Further, the collection of soil data to determine the nature of homeowner releases and to continue monitoring these homeowner releases, "until it is confirmed that soil vapor intrusion via soil gas is not a threat" is not relevant to Evergreen Manor groundwater.

Comment 23 All response action alternatives except No Action incorporate "Institutional controls for air (vapor intrusion)" (FS Section 3, p. 1). It has been shown that there is no correlation between contaminants in groundwater and indoor air and these institutional controls are unnecessary. Additionally, the overall trend towards decreasing VOC concentrations is clear and unequivocal.

Comment 24 Groundwater monitoring and vapor monitoring are not institutional controls. Institutional controls are "a legal mechanism for imposing a restriction on land use" (35 IAC 742.200). The relevant institutional controls are already in place, namely the local ordinance prohibiting groundwater use at the Site.

3.1 ALTERNATIVE 1: NO ACTION

Comment 25 There is a logical disconnect between the reason for rejecting this option ("no reduction of present and future risk") and the admission in the very next sentence that "the Site does not pose an imminent threat to human health and the environment". Since there are no imminent risks, a reduction in risk is unnecessary. Additionally, concentrations are declining and therefore any associated risk is being further reduced over time. A Site with no risk requires no remedial action.

Comment 26 EPA's contractor claims that this alternative "would not be effective in reducing the toxicity, mobility, or volume of the COCs within the various environmental media at the Site" (FS Section 3, p. 7). This is a disingenuous claim because EPA's contractor has already admitted that there is "an overall decreasing trend in chlorinated VOC concentrations over time" (Section 6, p. 3).

Comment 27 EPA's contractor claims that this alternative "would not be effective in reducing the toxicity, mobility, or volume of the COCs within the various environmental media at the Site" (FS Section 3, p. 7). This is directly contradicted by a comparison of the estimated time to achieve remedial objectives for Alternative 1 (15 years) and Alternative 3 (15 years).

Comment 28 EPA's contractor claims that "this alternative does not offer long term effectiveness and permanence because no remedial action is implemented" (FS Section 3, p. 8). This claim is incorrect because it ignores the corrective action that has already been completed. This alternative does offer long term effectiveness and permanence because all residences have been permanently connected to Municipal water and there is a local ordinance in place that prohibits the use of groundwater for domestic purposes. Furthermore, the contaminant concentrations in groundwater have been steadily declining and are expected to drop below drinking water standards in a few years.

3.2 ALTERNATIVE 3: MNA (PREFERRED ALTERNATIVE)

Comment 29 This alternative is unnecessarily encumbered with an investigation and monitoring program (described in the groundwater report) which is unnecessary and unsupported by the facts apparent in EPA's own Administrative Record.

Comment 30 EPA's contractor also claims that "[d]etailed contaminant fate and transport modeling would be needed to monitor the effectiveness of natural

attenuation." There is no indication that costly modeling is necessary. In fact, the existing data is already sufficient for an evaluation of natural attenuation.

Comment 31 EPA's contractor failed to evaluate the most suitable remedial alternative for this Site, namely monitored natural attenuation with "reasonable" monitoring. Specifically, as for other "MNA" Sites, the Evergreen Manor Site should have limited annual monitoring at a select number of wells to confirm the continuing efficacy of the remedy and document declining temporal concentration trends. Indeed, this alternative, was neither identified nor discussed by the Feasibility Study report.

4.0 SPECIFIC COMMENTS ON THE RISK ASSESSMENT PRESENTED IN THE REMEDIAL INVESTIGATION

Comment 32 The comments in this section pertain to Section 9, Human Health Risk Assessment of the Remedial Investigation Report, Evergreen Manor Site, Roscoe, Illinois, Roy F. Weston, Inc., March 2001.

The comments with regard to the remedial investigation show:

- Identification of chemicals of potential concern was performed incorrectly and generally not in accordance with EPA guidance
- The exposure assessment incorrectly assumes exposure pathways where none exist.
- Risk characterization is incorrect

4.1 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN (SECTION 9.2.3)

Comment 33 As stated by EPA's contractor (page 6), the Chemicals of Potential Concern (COPC) in Table 2.1 of Appendix A were screened against toxicity values with a cancer risk based concentration set at 0.1 in a million or an hazard index set at 0.1. This is an inappropriate screen. The EPA Region 3 guidance cited uses a risk level 1 in a million for screening.

Comment 34 The MCLs should have been used for screening groundwater. When the groundwater remedy was implemented at the Site, exposure to residents through drinking water was eliminated and an appropriate and conservative screen for groundwater becomes the MCL. If this had been done: acetone, methylene chloride and benzene would have been screened out of the analysis.

Comment 35 EPA's contractor did not screen based on detection frequency as recommended by EPA guidance. In accordance with EPA Region VIII guidance and Risk Assessment Guidance for Superfund (EPA 1994, and EPA 1998, respectively) for the selection of Compounds of Concern (COC) a 5 percent detection frequency screen should have been used.

Comment 36 Tetrachloroethylene, chloroform, benzene and methylene chloride are four of the five chemicals detected in groundwater but all of these were detected at a frequency of less than 5%. These chemicals should have all been eliminated from the risk assessment.

Comment 37 The regulatory screen used by EPA's contractor for chloroform is 0.02 µg/L or 20 parts per trillion, which is an unusually low standard, and lower than can typically be achieved by standard analytical method, thus ensuring that chloroform is selected even though it may never have been found at the Site. The safe drinking water act establishes a goal for the drinking water supply as 100 µg/L (EPA 1999 and 2002). So a goal of 1/10th of this, or 10 µg/L, would be more appropriate. Even if Illinois' lower standard is employed, then 0.2 µg/L (200 parts per trillion) would be appropriate for chloroform.

Comment 38 Acetone was correctly screened out of the risk assessment based on its maximum concentration being below its regulatory standard (Table 2.1, Appendix A, COPC Flag column). However, it was subsequently included in the risk assessment calculations. There is clearly an error in EPA's contractor's work.

Comment 39 Based on the use of a frequency of detection screen and regulatory screen, the only chemical detected frequently enough and above its regulatory screen was TCE. This is the only chemical that should have been evaluated in the risk assessment.

4.2 EXPOSURE ASSESSMENT (SECTION 9.3)

Comment 40 EPA's contractor selects three exposure pathways for evaluation in Section 9.3.2. None of these three pathways are complete because no resident at the Site is using groundwater. All of the residents are currently supplied by a municipal water supply.

Comment 41 There is no exposure to the residents and so there is no risk via these non-existent exposure pathways. The risk assessment should have been halted at this point because items (3) and (4), an exposure contact point and an exposure route are not complete. The remediation goals implemented at the Site should have been the regulatory goals, or the MCL.

Comment 42 EPA's contractor states that, "A distinct plume was not recognizable at the site" and they use this as a justification to use the maximum groundwater concentration. The lack of a clear groundwater plume indicates that groundwater is becoming cleaner over time. EPA's contractor does not state the other obvious fact, which is that the maximum concentrations of contaminants are barely above the MCL for PCE and TCE, and below the MCL for all other contaminants. Under these circumstances, it is not usual to continue evaluating groundwater at the Site. A better way of representing this

is, "A distinct plume was not recognizable at the Site because the Site is almost within regulatory groundwater limits." Further, EPA's contractor ignores guidance from EPA when determining an exposure point concentration. EPA guidance (EPA 1994b, EPA 1989, EPA 2002b) states that the 95% upper confidence limit (UCL) of the mean should be used when estimating the risk from groundwater. This guidance was developed for just this situation. If the concentrations of contaminants in groundwater are over an area (at low concentration) then potential exposure to receptors will also be over a wide geographic area and over an extended period of time, hence the use of an average is appropriate. There is an adequate data set and a 95% UCL is the appropriate measure of an exposure concentration. The use of the maximum detected concentration is inappropriate and suggests that an elevated risk may exist where there is none.

4.3 RISK CHARACTERIZATION (SECTION 9.5)

Comment 43 In the risk characterization Tables 8.1 CT, 8.1 RME, 8.2 CT, 8.2 RME, 8.3 CT, 8.3 RME the risks are marked as the Total Hazard Index. This is incorrect; the risks are excess lifetime cancer risks.

Comment 44 The exposure rates provided in the risk assessment would be appropriate if a risk assessment were necessary. In particular, the inhalation rates of 15 cubic meters per day (m³/day) for an adult is appropriate for estimating risks and should have been used in the revised inhalation risk assessment, as discussed below.

Comment 45 The uncertainty analysis presented in this section suggests that the risk assessment overestimates the risk by a single order of magnitude (RI Section 9, p. 24). This overestimate is too low. It incorrectly assumes that there is exposure when in fact there is no exposure through groundwater wells.

Comment 46 Table 9 4, Summary of Uncertainty Analysis provides EPA's contractor's view of the uncertainty in the risk estimate. EPA's contractor characterizes the potential for overestimation in the environmental data as "Low". This is incorrect and inaccurate. The potential for over estimation is "High" relative to the action level. The maximum groundwater value was used for the risk estimate and not the appropriate 95% UCL required by EPA Guidance. This overestimation leads to a relatively high calculated risk where there is none above EPA's acceptable risk range.

Comment 47 In the same table, EPA's contractor characterizes the potential for overestimation in exposure parameters as "Low". This is incorrect and inaccurate. The potential for over estimation is "High" relative to the action level because there is no

exposure via the non-existent exposure pathway incorrectly presumed to exist by EPA's contractor.

5.0 SPECIFIC COMMENTS ON THE AIR SAMPLING REPORT

Comment 48 The comments in this section pertain to the Air Sampling Report (Redacted Version), Evergreen Manor Site, Roscoe, Illinois, Weston Solutions, Inc., July 2003.

Comment 49 EPA's contractor cites the EPA's Vapor Intrusion Guidance (EPA 2002c), however they do not follow this guidance. This guidance requires an evaluation of the groundwater concentrations to Target Groundwater Concentrations provided within the guidance. This was not done either for the Site as a whole, or at the specific locations where indoor air data was collected. If that comparison had been made using the appropriate groundwater concentrations, either the 95% UCL of the groundwater data, or the actual 2002 groundwater concentrations at/near the residences sampled, it would be shown that the Target Groundwater Concentrations were not exceeded for any contaminant. The Target Groundwater Concentrations for TCE and PCE are 5 µg/L respectively. These concentrations are not exceeded at the Evergreen Manor Site (see later comments).

Comment 50 The data evaluation step indicates the approach used by EPA's contractor to determine if indoor and outdoor air samples were above risk based air criteria. EPA's contractor selected the most conservative of the criteria available, in this case those developed by Region IX. This selection of the most conservative screen is inappropriate because it is inconsistent with EPA's Vapor Intrusion Guidance, which is appropriately based on EPA's methodology for inhalation risk assessment (EPA 2001).

5.1 INDOOR AIR DATA

Comment 51 EPA's contractor conducts the air evaluation with no regard to the actual or potential concentration of contaminants in groundwater beneath each residence. In the Introduction (Section 1.1) and in Section 5.4 the stated objective is to determine whether a relationship exists between the VOC containing groundwater and any VOC concentrations measured in ambient air. However, in this section and later in the report, EPA's contractor only attempts to show that the contaminants are present in groundwater and makes no attempt to show that groundwater is the actual or potential source of indoor air chemicals. The data do not support such a connection.

Comment 52 The comparison of indoor air data to the criteria in no way links the sources of the contaminants to groundwater. Rather, the data for indoor air show chemicals that are due to indoor air sources. EPA's contractor fails to pursue this line of

reasoning and so is actually measuring background rather than groundwater derived contaminants. Further, the risks calculated are due to chemicals from indoor air sources and not groundwater. This is discussed in more detail in later comments.

Comment 53 Based on what they reported, EPA's contractor did not remove chemical sources from the residences at the time of sampling, thus the potential for contamination from indoor chemicals sources remained even though they were aware of the problem. This error led to elevated indoor air results and it is the risk from these chemicals that is being measured.

Comment 54 The data presented in Table 53 for residence B show that benzene is at higher concentrations on the first floor compared to the basement. This implies that the chemicals are not entering the house through the basement but via the first floor. This is not discussed by EPA's contractor in their evaluation of the data, but clearly is important with respect to the source of the chemicals.

Comment 55 The literature available on background indoor air includes a number of papers showing levels of chemicals such as benzene, TCE and PCE in indoor air. Some of the most recent data from Denver shows background benzene levels at 4 µg/m³ in residences, most without attached garages, and a maximum concentration of 64 µg/m³ (Foster, 2002). Other studies show the same ranges for benzene (MADEP 1998; Brown 1994; EPA IAQ, 1991).

Comment 56 Residence B has an attached garage where gasoline and other chemicals are stored. The sources of benzene in the house and the lack of benzene in groundwater are not discussed in the evaluation of the data. This information should have been used to eliminate this compound from evaluation at the Site.

Comment 57 The presence of chemical sources to indoor air other than groundwater is supported by the presence of methylene chloride at highly elevated concentration in indoor air but not in soil vapor. Groundwater is not the source of indoor air chemicals to Residence B there because there is little or no methylene chloride in soil vapor. Methylene chloride should have been eliminated as a chemical of concern due to its absence in groundwater and the low levels in soil vapor. Leaving the chemical in the report as a chemical of concern is misleading and allows for the inclusion of risks that are not attributed to groundwater.

Comment 58 Residence C has higher concentrations of chemicals other than from groundwater (specifically benzene, ethylbenzene, xylene, toluene and

methylethylketone), on the first floor compared to the basement, again indicating that groundwater is not the source of these chemicals.

Comment 59 Residence D has higher concentrations of chemicals (specifically 1,1,1-trichloroethene, methylethylketone, chloroform, benzene, ethylbenzene, xylene, toluene, methylene chloride, PCE and methylethylketone), on the first floor compared to the basement, again indicating that groundwater is not the source of these chemicals.

5.2 GROUNDWATER AND SOIL VAPOR

Comment 60 In the risk assessment prepared by EPA's contractor in 2001 they conducted a groundwater evaluation showing a summary of groundwater information for the Site. EPA's contractor should have prepared a statistical evaluation of the 2002 groundwater data as part of this analysis. A statistical evaluation of the data would show groundwater concentrations at the time of indoor air sampling; it would provide average and 95% UCL concentrations and would provide a basis for demonstrating any potential relationship between groundwater and indoor air.

Comment 61 Specifically for Area A chemicals that exceed the indoor air criteria, the evaluation performed by EPA's contractor should have identified the following:

- Benzene was not detected in groundwater and only found in one sample collected by CPT. No samples above the regulatory criteria, the MCL, of 5 µg/L and benzene should have been eliminated on this basis alone.
- Chloroform was not detected in any groundwater or CPT sample. It should have been eliminated from the risk assessment and eliminated as an indoor air chemical of concern.
- Methylene chloride data are not presented in Table 5.11. Groundwater data for this compound are important and should be presented to allow for the elimination of this chemical. Based on the groundwater database methylene chloride was not detected in groundwater and the chemical should have been eliminated from the risk assessment and eliminated as an indoor air chemical of concern.
- PCE was detected in three groundwater samples and one CPT sample. In none of the samples in Area A was the concentration above the regulatory criteria of 5 µg/L and all but one sample was qualified (either inaccurately measure or estimated). The 95% UCL of the data for the Site should have been calculated. If EPA's contractor would have calculated a 95% UCL concentration for Site wide PCE they would have

found it to be 3.5 µg/L, which is below the MCL and below the Vapor Intrusion Guidance Target Groundwater Concentration.

Comment 62 In Area A, chloroform was not found in soil vapor and should have been eliminated from further analysis.

Comment 63 Area B and C are grouped together for their groundwater analysis and for chemicals that exceed the indoor air criteria, EPA's contractor should have calculated and evaluated groundwater statistics for the Site for use in this area, which would have shown the following:

- Benzene was not detected in groundwater in any of the sampling events and should have been eliminated from the analysis.
- Chloroform was detected in one sample at an estimated concentration of 0.9 µg/L. The 95% UCL of the data should have been calculated in Area B and C.
- Ethyl benzene was not detected in groundwater in any of the sampling events and should have been eliminated from the analysis.
- Methylene chloride data are not presented in Table 5.11. Groundwater data for this compound are important and should be presented to allow for the elimination of this chemical. Based on the groundwater database methylene chloride was not detected in groundwater and the chemical should have been eliminated from the risk assessment and eliminated as an indoor air chemical of concern.
- PCE was detected in two groundwater samples at an estimated 0.9 and 2 µg/L, and one at 2 µg/L. No samples above the regulatory criteria of 5 µg/L. The 95% UCL of the data for the Site was 3.5 µg/L should have been used.

Comment 64 A more thorough evaluation of groundwater data in Area D would have revealed the following:

- Benzene was not detected in groundwater in any of the sampling events and should have been eliminated from the analysis.
- Chloroform was not detected in groundwater in any of the sampling events and should have been eliminated from the analysis.
- Ethyl benzene was not detected in groundwater in any of the sampling events and should have been eliminated from the analysis.
- PCE was not detected in groundwater in any of the sampling events and should have been eliminated from the analysis.

5.3 GROUNDWATER TO AIR PATHWAY

Comment 65 EPA's contractor provides adequate justification to eliminate benzene from the risk assessment analysis because, as they state, "it was found in low concentrations, infrequently and near to roadside contamination." In residences it is found with attached garages and in the first floor at a level higher than the lower floor. Nevertheless it was incorrectly retained in the risk assessment resulting in an artificially elevated risk that makes the Site appear to have a higher risk. This is also of concern because it leaves the public with the mis-impression that the groundwater is a problem rather than informing the public about internal sources of chemicals that should be reduced and managed.

Comment 66 EPA's contractor informs that the levels of chloroform in indoor air are probably due to the public drinking water supply at concentrations up to 32 ug/L. Retaining chloroform in the risk assessment leaves the public with the mis-impression that the groundwater is the source of this problem; rather than informing the public about potential problems with chlorination of the water supply.

Comment 67 EPA's contractor provides adequate justification to eliminate PCE from the risk assessment analysis because, as they state, it was found in low concentrations and infrequently. There are a number of sources of this chemical in indoor air and yet this chemical is retained for analysis throughout the risk assessment. PCE is found in background indoor air. In data collected recently in Denver, (Foster 2002) it was shown that PCE concentrations vary in indoor air up to 42 µg/m³, which is higher than the highest PCE concentration found at the Site. The average background at the Site in Denver is higher than most samples at the Evergreen Manor Site. It should also be noted that PCE is still used in the dry cleaning process and EPA's contractor did not review this issue with residents prior to sampling indoor air.

Comment 68 TCE is detected in groundwater and never detected in indoor air. This is very informative and indicates that the vapor pathway is not a source of chemical exposure at this Site. If vapor migration from groundwater to air were a significant pathway at this Site, TCE would be found in indoor air. This implies that compounds that do not migrate as a vapor in a similar way to TCE also should not be found in indoor air. TCE should have never be included in the indoor air risk assessment.

5.4 TOXICITY ASSESSMENT

Comment 69 The Slope Factor and associated Unit Risk Factor used to calculate risk in the Air Report is based on EPA's Draft Trichloroethylene Health Risk Assessment: Synthesis and Characterization (External Review Draft; EP A/600/P01/002A). This document and the dose-response relationship developed in it are flawed. The draft Trichloroethylene Health Risk Assessment (THRA) lacks the scholarship and objectivity necessary to derive appropriate estimates of risk for TCE because it contains many internal contradictions and relies heavily on speculation rather than hard evidence in making its case for carcinogenicity. The Slope Factor within this unapproved draft document should not have been used in the risk assessment.

Comment 70 Ecolab's critique joins that of others (Air Force, 2001) and asserts that the authors of the draft THRA have included studies without consideration of their quality or appropriateness for assessing human health risks. They have used epidemiologic and animal data selectively and, in some cases, have misrepresented those data. They have relied heavily (and nearly exclusively) on an inappropriate and inadequate analysis of the epidemiology literature and failed to distinguish between the concepts of association and causation. The authors of the draft THRA assigned to TCE effects that have been observed in populations (1) which were exposed to many different xenobiotics and (2) in which TCE exposures were not established or quantified. They used endpoints in target organs identified in animal studies regardless of the fact that they have been shown not to be relevant to humans and dismissed well-established hypotheses and instead presented and based toxicity values on speculative modes of action that often are inconsistent with the body of data. Based the assessment on sensitive subpopulations when there is no convincing evidence that they exist. The authors used poorly chosen studies as the basis for calculating toxicity values and failed to realize that increasing knowledge is supposed to reduce uncertainty. They have been inconsistent both in their derivation of the points of departure and in their use of uncertainty factors in the development of toxicity values. In short, the classification of TCE as "highly likely to produce cancer in humans" appears to be based on an unproven hypothesis rather than on sound scientific evidence.

Comment 71 EPA's contractor used the Cancer Slope Factor for PCE provided in the Vapor Intrusion Guidance and by the Cal EPA Air Toxics Hot Spot Program. Any information used in a risk assessment should be reviewed to ensure that it is current. The Inhalation Slope Factor for PCE was removed from EPA's Integrated Risk Information System (IRIS) and a new value is in the process of being developed by EPA. However, EPA has not issued the new value on its IRIS database. In the absence of a Slope Factor on IRIS the National Center for Exposure Assessment (NCEA) issues

provisional Slope Factors. When NCEA was contacted for a provisional Inhalation Slope Factor for PCE they provided an value that was different for that used by EPA's contractor. The value was the same as that used by EPA's contractor in their 2001 risk re-assessment. The Slope Factor provided to us by the NCEA was 2×10^{-3} (mg/kg/day)⁻¹ this value should be used.

5.5 RISK CHARACTERIZATION (SECTION 7.5)

Comment 72 The equation provided in Section 7.5 for the estimation of cancer risk is confusing and incorrect. The exposure point concentration for chemicals in indoor air is provided in the units of milligrams per kilogram (mg/kg), but was actually measured in micrograms per cubic meter (µg/m³). The risk based concentrations in the equation are also in units of milligrams per kilogram (mg/kg), but was actually calculated in micrograms per cubic meter (µg/m³).

Comment 73 The method used to calculate risk is inconsistent with the risk assessment prepared in 2001, and is more conservative. The exposure assumptions developed in the 2001 risk assessment assumed an adult inhaling 15 m³/day of air per day. This risk re-assessment uses the California and Vapor Intrusion Guidance default inhalation assumptions of 20 m³/day. These are screening tools and should not have been used to estimate risk.

Comment 74 The risk calculations conducted in Table 7.2 for each of the four exposure areas calculates risk for indoor air and for soil vapor, assuming a soil vapor attenuation factor of 0.1. The risk calculation is generally conducted in the absence of indoor air data to gain an understanding of what concentrations in indoor air might look like. To use these data as if they are indoor air and then select them as representing indoor air risks is completely inappropriate. The actual risk to the resident is the indoor air risk found by evaluating the indoor air data and not the hypothetical soil vapor risk.

Comment 75 In Table 7.2 EPA's contractor indicates their understanding of the relationship between groundwater and indoor air with the column, "Could Chemical Concentration Be Site Related." This column reflects a failure to properly understand the vapor intrusion pathway. Since benzene is never found in groundwater it is not Site related. Since TCE is never found in indoor air, it is not, an indoor air problem (Table 7.2 Area B). Similarly, benzene and methylene chloride are never found in groundwater. Therefore, they cannot be an indoor air problem (Table 7.2 Area C).

Comment 76 When the compounds not found in groundwater are eliminated there only two chemicals for which indoor air risks could be calculated as being due to groundwater. One of these chemicals, TCE, was never found in indoor air and the other, PCE, is also associated with indoor air chemicals such as dry cleaning, and household products. This chemical is present in very low concentrations in ground water (95% UCL = 3.5 µg/L). Even if one considers the risk to be associated with groundwater; which it is not, the indoor air risk at the Site are within the 1 in 1 million risk to 100 in a million risk range. By including chemicals that are not related to groundwater, EPA's contractor is showing the Site groundwater to represent a risk where there is in fact no risk from groundwater.

Comment 77 In summary, indoor air measurements are consistent with indoor air chemicals from residential sources and not from groundwater. Studies of indoor air that demonstrate this fact include Foster et. al., 2002; Kurtz and Folkes 2002; MADEP 1998; Brown 1994; EPA IAQ, 1991.

6.0 SPECIFIC COMMENTS ON THE RECALCULATED CANCER RISK

Comment 78 The comments in this section pertain to the Recalculated Cancer Risk For Adult Exposure To Groundwater Using Reasonable Maximum Exposure Assumptions In 2001 Risk Assessment With Revised Toxicity Values For TCE and PCE and 2002 Groundwater Data, Roscoe, Illinois By Weston, EPA, July 2003.

Comment 79 On August 26, 2003, EPA released a letter that contained a one page addendum to Section 9, Risk Assessment, of the Weston 2001 Remedial Investigation Report (Weston, 2001). This addendum, titled "Recalculated Cancer Risk For Adult Exposure to Groundwater Using Reasonable Maximum Exposure Assumptions in 2001 Risk Assessment With Revised Toxicity Values For TCE and PCE and 2002 Groundwater Data" was a series of risk re calculations for an adult hypothetically exposed to groundwater. This spreadsheet contained no text providing the source of the information contained within it, except a reference to Weston's 2001 risk assessment. This is inappropriate; calculations that form the basis for remedial decisions should be fully transparent, documented and understandable to all stakeholders and the public. EPA's contractor should have provided a full description of the methods used.

Comment 80 If EPA's contractor's 2001 risk assessment is the basis for the risk assessment, it incorrectly assumed that no remedy had been implemented at the Site and local groundwater was a source of risk via ingestion, dermal contact and inhalation. This assumption is incorrect because a groundwater remedy is in place and residents are exposed to consuming the groundwater.

Comment 81 If the spreadsheet provided by EPA's contractor uses methodology based on their 2001 risk assessment, as indicated in the title, the method omits the child exposure scenario from the overall calculation of risk. We recognize that a child/adult risk scenario would result in higher risks; however, we do not believe this method is appropriate for inhalation risk estimates. Either method incorrectly assumes that no remedy had been implemented at the Site and local groundwater is the source of risk via ingestion, dermal contact and inhalation. This assumption is incorrect because a groundwater remedy is in place and no residents are consuming the groundwater.

Comment 82 EPA's contractor used a groundwater concentration of 0.0079 (units not provided, but assumed to be milligrams per liter (mg/L)). This concentration could not be found in the Evergreen Manor groundwater database for any sampling event, including 2002 groundwater data as stated in the title. Indeed this datum is higher than any of the TCE or PCE concentrations ever reported by EPA in the 2002 data set but was nevertheless used to represent the TCE concentration across the entire Site.

Comment 83 The highest groundwater concentration for TCE in the Evergreen Manor database was 0.0072 (J) mg/L. This value is marked with a "J" qualifier indicating the value was not accurately measured but estimated. A single estimated data point to represent an area should not be used for the purposes of quantitatively estimating risk and for selecting a final Site remedy.

Comment 84 The highest unqualified, accurately measured, TCE concentration at this Site was 0.0047 mg/L. This concentration is below the MCL for TCE and therefore the site is in compliance with the groundwater ARAR for TCE.

Comment 85 As noted above, it is more appropriate to estimate risks using the 95% UCL concentration of chemicals in groundwater. TCE and PCE groundwater concentrations are 0.0035 and 0.0025 mg/L, respectively, using 2002 data. If these concentrations were used in EPA's contractor's spreadsheet the actual risks calculated would be 4.7×10^{-5} and $2.76 \times 2.76 \times 10^{-5}$ with a summed risk of 7.47×10^{-5} , which is less than 1×10^{-4} EPA's acceptable risk level.

Comment 86 Further, EPA's contractor used a method that is inconsistent with the Vapor Intrusion Guidance. If this method had been used the results would have been lower still. If the appropriate 95% UCL concentrations were used in EPA's contractor's spreadsheet with an adult scenario, even assuming an inhalation rate of 20 m³/day, rather than 15 m³/day, the actual risks would be 5.98×10^{-5} and 2.76×10^{-5} with a summed risk of 3.46×10^{-5} , which is less than 1×10^{-4} , EPA's acceptable risk level.

Comment 87 EPA's contractor used Slope Factor for TCE and PCE that are not listed on IRIS. If appropriate Slope Factors had been used the results would have been lower still. If the 95% UCL concentrations were used in EPA's contractor's spreadsheet with an adult scenario, even assuming an inhalation rate of 20 m³/day and the old Slope Factors that are either NCEA provisional values (PCE) or the old Slope Factor (PCE and TCE) the actual risks would be 1.3×10^{-6} and 2.76×10^{-5} with a summed risk of 3.3×10^{-6} , which is less than 1×10^{-4} EPA's acceptable risk level.

Comment 88 Based on these calculations, which are more consistent with EPA's guidance than the work conducted by EPA's contractor, the site should not be the subject of further investigations.

7.0 **SPECIFIC COMMENTS ON THE GROUNDWATER DATA EVALUATION REPORT**

Comment 89 The comments in this section pertain to the Groundwater Data Evaluation Report (Redacted Version), Evergreen Manor Site, Roscoe, Illinois, Weston Solutions, Inc., July 2003. EPA's contractor suggests that the presence of any uncertainty is sufficient cause to perform additional work. Comments regarding the details of the unnecessary recommended supplemental work activities are provided, and can be summarized as follows:

- EPA's contractor downplays the effectiveness of their own RI, etc.
- EPA's contractor overestimates chemical exposure
- The proposed work improperly addresses issues not related to this site
- There is no correlation between concentrations in groundwater and indoor air
- Ambient air PRGs are improperly applied to soil gas
- The soil gas confirmation methodology is unreliable
- EPA's contractor makes an unsupported DNAPL claim
- Investigation may create homeowner PRPs
- Source identification is unwarranted because the implemented remedy is protective

7.1 **EPA'S CONTRACTOR DOWNPLAYS THE EFFECTIVENESS OF THEIR OWN RI**

Comment 90 In a single paragraph review of the RI, EPA's contractor uses the terms "limited sampling" (twice), "limited data", and "limited work" (Section 2, p. 6). None of these terms appear in the RI. To the contrary, the RI states that additional "soil and sediment sampling is not warranted, and no new monitoring wells are recommended at this time" (RI Section 11, p. 7).

Comment 91 EPA's contractor states that "[n]one of the investigations conducted to date represent a comprehensive and consistent evaluation of the overall conditions present at the site," (Section 6, p. 5). EPA's contractor goes on to state "variability in project objectives, sampling methods, parameters and frequency [of previous investigations] could lead to erroneous interpretation of data which in turn could lead to misinterpretation of actual site conditions" (Section 6, p. 6). If the RI is limited, inconsistent, non comprehensive, and leads to erroneous interpretation of data, then it is also likely not consistent with the requirements of the NCP. Alternately, if the RI fulfills

the requirements of the NCP then the recommendation for an extensive investigation is largely unnecessary.

7.2 EPA'S CONTRACTOR OVERESTIMATES CHEMICAL EXPOSURE

Comment 92 The RI is described as finding that "residential groundwater exposure risk estimates ranged from 4.6E 6 to 1.9E 5," (Section 2, p. 7). The fact that the removal action "effectively eliminated the residential well exposure pathway" (RI Section 11, p. 6) is omitted from the discussion of risk and that any evaluation of the groundwater exposure risk is therefore hypothetical.

Comment 93 The highest TCE detection of 7.2 µg/L is consistently misreported without the "J" (estimated) qualifier in the text (Section 4, p. 6, Section 5, p. 7).

Comment 94 Chloroform was detected at a concentration of 0.23 µg/L in a sample collected from MW-02. This sample is evaluated (Section 4, p. 7 and p. 13) without regard for the suspect laboratory contamination of this sample as indicated by the concentrations in the field blank, which were "greater than 10 times the concentration detected in monitoring well MW-02" (Section 5, p. 9). In fact, EPA's contractor acknowledges that this result should be considered a non detect (Section 5, p. 9), but does not carry through on its own recommendation.

7.3 THE PROPOSED WORK IMPROPERLY ADDRESSES ISSUES NOT RELATED TO THIS SITE

Comment 95 The scope of work includes an investigation of PCE concentrations in municipal wells that are 1) beyond the site boundaries, and 2) currently attributed to solvent impacted material used in the construction of the well.

Comment 96 "Due to the presence of the PCE based coating [on the well piping], and the distance between Evergreen Manor contaminated groundwater plume (both vertically and horizontally), it does not appear that the impacts observed in the groundwater samples collected from the NPPWD municipal wells is attributable to the site based on current data and information" (GDER Section 5, p. 10).

7.4 CONCLUSIONS REGARDING INDOOR AIR

Comment 97 Indoor air sampling indicated that potential cancer risks were within EPA's acceptable risk range.

Comment 98 Indoor air and soil gas samples did not correlate with groundwater concentrations.

- "the highest PCE and TCE concentrations... [are located] where, historically, PCE and TCE concentrations in the residential wells have been either non detect or detected at concentrations below the drinking water standards" (Section 4, p. 12).
- "PCE and TCE concentrations in soil gas samples at much lower levels... [were found in] areas where, historically, high TCE concentrations have been reported in groundwater samples" (Section 4, p. 11).

Comment 99 A somewhat more cogent acknowledgement is provided later in the report, "Some of the highest levels of PCE and TCE concentrations in soil gas were found in areas with some of the lowest levels of groundwater contamination" (Section 7, p. 9).

Comment 100 The analytes detected in indoor air are commonly associated with residential building materials (e.g., pressboard and paint) residential chemical use (e.g., gasoline for lawnmowers, solvents for hobbies and crafts, bleach for laundry), and secondary sources (e.g., dry cleaning solvent residual on laundry). Although widely known, this fact is not mentioned by EPA's contractor

Comment 101 Significantly, EPA's contractor omits the fact that the indoor air sample results were within the range of typical residential "background" concentrations. Such background concentrations are generally attributed to building materials and residential chemical use.

Comment 102 The conclusion strongly suggested by these facts is that soil gas and indoor air concentrations are fully explained by background concentrations associated with typical residential use.

Comment 103 EPA's contractor, however, reaches an alternative conclusion which forms the basis of an extensive investigation of indoor air, soil gas, groundwater, and soil at up to 50 to 75 homes (Section 7, p. 11). Specifically, they downplay the results of their investigation with the statement, "it is not known whether a direct correlation exists

between groundwater concentrations and the elevated soil gas concentrations" (Section 5, p 22)

Comment 104 The Southeast Rockford Superfund site provides a useful comparison for the scope of the work proposed at the Evergreen Manor Site. The Southeast Rockford site is much larger, includes a much larger population, and has concentrations of contaminants that are hundreds of times higher than the Evergreen Manor site. Even though previous investigations of Southeast Rockford indicated that "harmful levels of vapors were not found in homes near the sources of contamination," [Emphases Added] the IEPA plans to perform residential air sampling "to make sure that vapors from these contaminants were not seeping into nearby basements" (Update, Southeast Rockford Groundwater Contamination Superfund Project, Residential Indoor Air Sampling, Illinois Environmental Protection Agency, March 2003). The proposed work includes 10 houses.

Site		Number of Proposed Air Samples	Concentrations of Select Analytes in Groundwater	
			Maximum detected VOC (ug/kg)	Maximum detection of PCE/TCE (ug/L)
Southeast Rockford	Area 4	5	1,000 (111TCA)	28 (TCE)
	Area 7	5	31,000 (ethylbenzene)	1,200 (PCE)
Evergreen Manor		50 to 75 (GDER) 100 - 200 (Proposed Plan)	7.2J (TCE)	7.2J (TCE)

7.5 SOIL GAS CANCER RISKS

Comment 105 Potential cancer risks have been calculated for soil gas (GDER Section 5, p 21). Soil gas is also compared to RBC concentrations (GDER Section 7, p 1). However, there is no direct exposure scenario for soil gas because it occurs in a solid material.

7.6 THE SOIL GAS CONFIRMATION METHODOLOGY IS UNRELIABLE

Comment 106 "Soil sampling would be needed at locations where groundwater sample results do not correlate well with soil gas sample results to determine whether there are any homeowner related spills" (Section 7, p 11).

Comment 107 Contaminants in soil gas tend to spread out through vapor dispersion, at best forming a halo around the source. If soil gas concentrations are related to

"homeowner related spills" there is no real expectation that the spill would have to be at that exact location. If the soil gas was collected in the halo rather than the source, a corresponding soil sample would find nothing.

Comment 108 The soil confirmation methodology recommended by EPA's contractor is unreliable and should be abandoned.

7.7 GROUNDWATER FLOW

Comment 109 The potentiometric surface map (GDER Figure 3 2) is based on 13 measurement locations. This figure indicates that the potentiometric surface is very simple. Groundwater simply flows in a southerly direction towards the Rock River. This, by itself is an indication that groundwater discharges to the Rock River.

Comment 110 The geologic cross section (GDER Figure 3 1) illustrates that there is no confining layer or other feature that would allow flow to be isolated from the hydraulic effects of the Rock River. This is confirmed by the minimal vertical gradients indicated in the RI, where the "biggest difference in groundwater elevations at any well cluster measured was 0.08 ft." (RI Section 5, p. 9).

Comment 111 Although the "Rock River is presumed to be the groundwater discharge location for the shallow sand and gravel aquifer" [Emphasis Added] (GDER Section 3, p. 7), EPA's contractor implies an uncertainty that is unwarranted based on the 19 years of investigative data available (CRA 1997).

Comment 112 EPA's contractor claims that "[a]lthough attempts to map groundwater flow across the site conclude that the overall lateral groundwater flow direction is towards the Rock River, insufficient spatial data points are available to evaluate local variation in groundwater flow patterns (direction and velocity). This is especially true with regards to vertical flow characteristics across the site." (GDER Section 7, p. 8).

Comment 113 EPA's contractor has proposed a substantial field program (11 new piezometers) to address this perceived deficiency (GDER Section 7, p. 10).

Comment 114 However, EPA's contractor admits that the "gradient across the site is fairly uniform" and the potentiometric surface map (Figure 3 2) confirms that the potentiometric surface is very simple.

In fact, groundwater flow at the Evergreen Manor Site "have generally remained constant" over 19 years of investigation (CRA 1997, p. 8).

Comment 115 Furthermore, vertical flow has already been evaluated in the RI. Vertical flow has little significance because the "biggest difference in groundwater elevations at any well cluster measured was 0.08 ft." (RI Section 5, p. 9).

This reflects earlier conclusions by CRA that suggest "predominantly horizontal flow within the upper 100 feet of the sand and gravel deposits" (CRA 1997,p 8).

7.8 THE DNAPL CLAIM

Comment 116 EPA's contractor states that "[q]uestions remain, however, such as whether past releases were in the form of dense non aqueous phase liquids (DNAPL). These may have resulted in very deep portions of the aquifer being contaminated, and shallower portions only exhibiting patterns of contamination consistent with that of residual contamination." (GDER Section 7, p. 8).

Comment 117 EPA's contractor has recommended a very large and expensive investigation to address this "uncertainty" (GDER Section 7, p. 9).

Comment 118 There is absolutely no evidence to suggest that DNAPL is a concern at this Site. There are a variety of methods available to environmental scientists to evaluate whether DNAPL is present at a site. The most common screening method used is a comparison of contaminant levels at locations downgradient of a suspected source to 1% of the analyte's solubility. If the concentration exceeds 1% of the solubility, then it is an indication that DNAPL might be present. Applying this rule to the site yields the following:

	Minimum Concentration Indicative of the Presence of DNAPL (µg/L)	Maximum Reported Concentrations (µg/L)
PCE	2,000	5.9
TCE	11,000	7.2J

Comment 119 There is no evidence that would suggest the presence of DNAPL and the claims of EPA's contractor fly in the face of reputable and established environmental science.

7.9 INVESTIGATION MAY CREATE HOMEOWNER PRPS

Comment 120 The contaminant concentrations found in groundwater are very low. The chemicals detected are used in common household products (e.g., paint and carpet stain remover). Small spills onto the ground could cause these concentrations. Small discharges to the septic system could cause these concentrations. It is likely that at least a portion of the concentrations detected in groundwater originate from residential sources.

Comment 121 EPA's contractor has recommended an extensive investigative program whose purpose is to identify sources of contamination (e.g., septic systems) at residences (Section 7, pp. 11 12). The investigation will target 20% of homes (Section 7, p. 11).

7.10 SOURCE IDENTIFICATION IS EXTRAVAGANT AND WASTEFUL

Comment 122 EPA's contractor concluded that, "data may not be sufficient to adequately determine the location and nature of the source(s). Thus, the source(s) of contamination, whether multiple sources, extraneous sources, point source or continuing source, remain unknown, and additional effort may be warranted to address this issue." (Section 6, pp. 3 4)

Comment 123 With regard to source identification in the residential areas, EPA's contractor states, "[s]eptic systems, used by most, if not all of the Evergreen Manor subdivision residents, may be a point source of certain contamination (e.g., use of chemicals to unclog a drain)" (Section 7, pp. 11 12) and "contaminants that have not been characterized or quantified may be present... in the vadose zone in these [residential] areas," (Section 7, p. 9).

Comment 124 EPA's contractor recommends an extensive investigation to locate these potential sources. (Section 7, p. 12).

Comment 125 The additional work is directly contradictory with the conclusions of the RI, which states, "no further attempts at source identification are recommended." (RI Section 11, p. 7)

Comment 126 Furthermore, EPA's contractor admits "that the source(s) may not represent a continuing source of groundwater contamination" (Section 6, p. 3) and there

is "an overall decreasing trend in chlorinated VOC concentrations over time" (Section 6, p. 3).

8.0 CONCLUSIONS

The evaluation of the No Action alternative resulted in an inappropriate rejection of all the evaluation criteria, and does not acknowledge the response actions taken to date.

The development of the MNA alternative includes additional investigative tasks that are excessive in scope and unwarranted.

Based on all the comments provided on the Proposed Plan and the various reports and plans, it is apparent that the development of alternatives should be modified. Moreover, it is apparent that a re-evaluation of existing alternatives is warranted based on a scientifically reliable evaluation of Site risks.

The failure to include completed response actions in the No Action alternative, and the inclusion of unjustified investigative tasks in the MNA alternative indicate that the development of alternatives in the Proposed Plan is critically flawed. To address these issues, it is recommended that EPA re-evaluate the risk assessment and remedial alternatives with the inclusion of the following additional alternatives:

- **Alternative 1B – No Additional Action.** This alternative would be identical to the existing No Action alternative except that the response actions which have already been completed at the Site (connection of residents to a municipal water supply and a local ordinance prohibiting groundwater use) would be appropriately recognized.
- **Alternative 3B – Continued Monitoring.** This alternative would be identical to the existing MNA alternative except that monitoring would be limited to periodic sampling of the existing well network consistent with most other MNA remedies selected by EPA.

9.0 REFERENCES

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